Year 2010 Water Quality Report

Fort Irwin routinely monitors for constituents in the drinking water according to Federal and State laws. Fort Irwin would like to present to you a summary of last year's sampling results. This document also explains the results and provides contact information.

It is important to Fort Irwin that our customers be informed about water quality on the installation.

MUY IMPORTANTE

Este informe contiene informacion muy importante sobre su agua potable. Traduzcalo `o hable con alguien que lo entienda bien.

If you have questions concerning this report contact: Water and Wastewater Manager, Fort Irwin DPW, 760-380-4987.

Fort Irwin posts several years of water reports and other environmental information at: http://www.irwin.army.mil/Post/Environment.

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Water Quality Monitoring

It is Fort Irwin's responsibility to provide water system customers with an annual report. This document covers the requirement for a Consumer Confidence Report (CCR). It is important to keep customers informed about the water quality and services delivered over the past year. Fort Irwin's goal is to provide a safe and dependable supply of

drinking water. A percentage of the water pumped is run through a Reverse Osmosis Treatment Plant to meet drinking water standards.

In order to ensure that tap water is safe to drink, United States Environmental Protection Agency (USEPA) and the California Department of Health Services (DHS) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. Department regulations also establish limits for contaminants in bottled water that must provide the same protection for public health.

Last year, we conducted more than 3,700 tests for 129 different contaminants. This report covers monitoring from 1 January 2010 through 31 December 2010. The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently. Some of the data presented in this report, though representative, is more than one year old.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's safe drinking water hotline at 1-800-426-4791 or at their web site www.epa.gov/safewater/

Fort Irwin's Water Source

The type of water found at the NTC is groundwater, meaning it comes from underground aquifers from one of or a combination of three sources: 1) Bicycle Lake Basin, located approximately 2 miles northeast of the cantonment area adjacent to Barstow Road; 2) Langford Lake Basin, located approximately 2 miles southeast of the cantonment area adjacent to Langford Lake Road; and 3) Irwin Basin, located within the cantonment area itself. Fort Irwin pumped about 892 million gallons of water out of the ground last year. Fort Irwin's water system provides water to approximately 18,000 customers daily.

A source water assessment was completed in 1997 in the form of a document entitled "Ground Water Hydrology and Water Quality of Irwin Basin At Fort Irwin and The National Training Center, California". The assessment was conducted by US Geological Survey Information Services, Box 25286, Federal Center, Denver, CO 80255. Source water assessments for Langford Lake and Bicycle Lake Basins are not available. A copy of the Irwin Basin Assessment can be viewed at the County of San Bernardino District Office, 464 West 4th Street, Suite 437, San Bernardino, CA 92401. You may request a summary of the assessment be sent to you by contacting the DHS District Engineer at (909) 383-4328.

Unique to Fort Irwin

Fort Irwin's Water System is operated under a privatization contract. As the system ownership is not transferred, compliance responsibilities still reside with the U.S. Army.

Fort Irwin has two water systems. A Reverse Osmosis or RO System and a domestic use system or DU system. The domestic use (DU) water is higher than the California standard in fluoride (MCL = 2 mg/L) and arsenic (MCL = 10 µg/L). DU water is intended for use in washing, cleaning, irrigation, and other non-potable uses.

To ensure Fort Irwin's water meets all standards, Fort Irwin treats a portion of the DU water in our water treatment plant. The Fort Irwin Water Treatment Plant uses a Reverse Osmosis treatment process to remove contaminants. The Reverse Osmosis treated water is the water you drink out of the RO system.

The RO system provides drinking and cooking water. RO water meets all drinking water standards including fluoride and arsenic. The RO system is visible in housing or your work space as either a RO water tap (shown at left) usually in the kitchen or a water fountain (shown at right).

System Improvements

Fort Irwin has completed the design of a new Water Treatment Facility. Our goal is that by the end of the year 2013, we will begin constructing the new water treatment plant. By 2016 all water provided will meet or exceed the Federal and State maximum contaminant level (MCL). At that time the system ownership and permits will be transferred to the privatization contractor.

Fort Irwin has also contracted with the United States Geological Survey (USGS) to conduct surveys of potential water resources. This effort will take many years. But the final products will identify future water resources.

Should Customers be Concerned?

Last year, water tested from Fort Irwin's domestic use system contained Fluoride and Arsenic higher than the required drinking water standards. Fluoride concentrations in the DU system are higher than the acceptable State of California standard. California requires water systems to use the following public notice:

> *"Some people who drink water containing fluoride in excess of the Federal MCL of 4 mg/L over many years may get bone disease, including pain and tenderness of the bones. Children who drink water containing fluoride in excess of the State MCL of 2 mg/L may get mottled teeth."*

Arsenic concentrations in the DU system are higher than the new Federal MCL of 10 µg/L. The State of California requires us to issue the following public notice:

> *"Some people who drink water containing arsenic in excess of the MCL over many years may experience skin damage or circulatory system problems, and may have an increased risk of getting cancer."*

MCL's are set at very stringent levels. To understand the risk of possible health effects described for regulated contaminants, customers should know that a person would have to drink 2 liters of water every day at the MCL level during a lifetime to have a one-in-a-million chance of having the described health issues.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer

undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

Water Conservation

Conserving water at Fort Irwin is as important to the installation as breathing the air. Without water, there is no Fort Irwin. Fort Irwin is supported by our own water wells. Results from environmental engineering reports show a limited supply of available water. It is only replenished by the small amount of rain we receive annually, so we pump out much more than we take in.

Conserving water is very important for several reasons. The primary being the cost to have a water line brought in from another water provider would be very expensive. Then we would have to buy our water rather than only paying the cost to pump it from the ground. Fort Irwin is very reliant on you, the consumer, to conserve this natural resource. Below are some tips on how to conserve water and help extend our water supply on Fort Irwin. Other conservation tips can be found at http://www.bewaterwise.com/.

Wash only full loads of laundry in your washing machine or full loads of dishes in your dishwasher. You'll not only save our water, but conserve energy as well.

Turn the water off. Minimize faucet use when shaving, brushing teeth and washing dishes. If your faucets or showerheads are leaking, call the housing office to report it.

Shorten your shower time by one minute. Cut back on your shower time and you will save big time on water use. Or limit your showers to 5 minutes. This not only saves water but energy as well.

Don't pre-rinse your dishes. Check to see if you dishwasher can clean dishes without pre-rinsing them. Most newer dishwashers don't require pre-rinsing.

Reuse clean household water. Collect all the water that is wasted while waiting for the hot water to reach your faucet or showerhead. Use this to water your houseplants or outdoor planters. Do the same with water that is used to boil eggs and steam vegetables.

Use a car wash that recycles water. The car wash on Fort Irwin recycles water. Or if you wash your car at home use a nozzle that shuts off when not in use.

Call in water breaks. If you have a water leak, or notice a water problem, please call the appropriate number on Fort Irwin to report it:

- In Housing: **(760) 386-HOME (4663)**, Pinnacle
- Cantonment: **(760) 386-3539**, IAP
- Major Breaks: **(760) 386-7906**, CH2MHill

Definitions

On the following pages are table containing summarized results of our monitoring. To understand these terms, Fort Irwin has provided the following definitions:

Non-Detects (ND) - Laboratory analysis indicates that the constituent is not present.

Parts per million (ppm) or Milligrams per liter (mg/L) - One part per million corresponds to one minute in two years, or a single penny in $10,000.

Parts per billion (ppb) or Micrograms per liter (µg/L) - One part per billion corresponds to one minute in 2,000 years, or a single penny in $10,000,000.

Nephelmetric Turbidity Unit (NTU) - Nephelmetric turbidity units are a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Regulatory Action Level (AL) - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Maximum Contaminant Level Goal (MCLG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's are set by the U.S. Environmental Protection Agency (USEPA).

Public Health Goal (PHG) - The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Primary Drinking Water Standard (PDWS) - MCL's for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

Maximum Contaminant Level (MCL) - The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste, and appearance of drinking water.

Safe Drinking Water Act (SDWA) - Federal law which sets forth drinking water regulations.

Maximum Residual Disinfectant Level (MRDL) - The level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap.

Maximum Residual Disinfectant Level Goal (MRDLG) - The level of a disinfectant added for water treatment below which there is no known or expected risk to health. MRDLGs are set by the (USEPA).

Reverse Osmosis (RO) - The process which forces water through a special membrane with very small pores separating salts and other contaminants in a brine solution. When applied to water systems this process is energy intensive (high pressure pumps). On Fort Irwin RO also signifies the distribution system for water treated at the RO plant.

Disinfection Byproducts - Results from adding chlorine to the water to kill or suppress bacteria and other harmful organics. When chlorine is added it reacts with the carbon material forming byproducts that the USEPA and CA DHS believe is harmful.

The following tables present the results of our monitoring for the reporting period of 2006. In reading the tables, compare the MCL column to the Average Level Detected column.

Sources of Contaminants and Tables

Source of drinking water (both tap water and bottled water), include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and Herbicides, which may come from a variety or sources such as agriculture, urban storm water runoff, and residential uses.
- Organic Chemical contaminants, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities

Microbial Monitoring

Microbial Monitoring is conducted on a weekly basis on Fort Irwin. This monitoring uses the coliform bacteria as an indicator for all microbial contaminants. Coliform is used because it is present in the environment, it is more resistant than other bacteria and it is easy to detect. Table 1 has the results from bacteria monitoring.

Table 1: Microbial Monitoring

Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Highest Number of Positive Results	Number of Months exceeding MCL	Highest Number of Positive Results	Number of Months exceeding MCL			
Total Coliform Bacteria	Positive Samples per month	0	0	0	0	More than 1 positive sample in a month	No Positive	Naturally present in the environment

Lead and Copper

Fort Irwin tests for lead and copper at selected taps in our water system. Results from the lead and copper testing indicate the corrosiveness of Fort Irwin's water. Lead and copper are leached from the plumbing inside the buildings. After you go on a long vacation, it is a good idea to run the tap for a few minutes to flush the water lines. Table 2 contains the result from monitoring of lead and copper. Compare the 90% level to the Action level.

Table 2: Lead and Copper Monitoring

Analyte	Unit	RO Water System			Domestic System			Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Maximum Detected	90 % Level*	Sites Tested	Maximum Detected	90 % Level*	Sites Tested			
Lead (Pb)	µg/L	50	ND	30	ND	ND	30	AL** = 15	2	Internal corrosion of household water plumbing systems
Copper (Cu)	mg/L	0.190	0.057	30	0.91	0.071	30	AL** = 1.3	0.17	

All results for lead and copper are from 2010. The State of California allows reduced sampling of once every three years for low risk systems.

*90% or more of the monitoring results were below this result.

**AL or regulatory action level is set by the California DHS. If exceeded preventive treatment is required, equivalent to a MCL.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Fort Irwin is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Regulated and non-regulated contaminants:

Fort Irwin is required each year (or other period) to test for Contaminants the EPA and CA DHS are concerned about. We also test our water for indicators of water quality. These indicators of water quality help Fort Irwin provide the best water possible. Table 3 contains the monitoring results from 2010 and previous years.

Table 3: Regulated and non-regulated contaminants

Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Range Detected	Average	Range Detected	Average			
EPA and State Regulated								
Arsenic (As)*	µg/L	ND *09*	ND *09*	ND - 36	14.43	10	0.004	Erosion of natural occurring deposits
Boron (B)**	µg/L			660 - 1400 *07*	962.9 *07*		1000	State Regulated No MCL: Erosion of natural occurring deposits
Cadmium (Cd)	µg/L	2.8 *04*	2.8 *04*	ND *09*	ND *09*	5	0.04	Erosion of natural occurring deposits
Chloride (Cl)	mg/L	12 - 21 *08*	16 *08*	65	65	500		Secondary Drinking Water Standard: Erosion of natural occurring deposits
Chromium (Cr), Total	µg/L			8.2 *09*	8.2 *09*	50	100	Erosion of natural occurring deposits
Hexalvent Chromium (Cr), Chromium VI	µg/L	ND - 1.5 *04*	0.75 *04*	1.3 - 13 *07*	5.42 *07*			
Color	S.C.U.	0 - 20	0.73	0 - 3 *09*	1.0 *09*	15		Secondary Drinking Water Standard: Naturally-occurring organic materials

* Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.

** The babies of some pregnant women who drink water containing boron in excess of the notification level may have an increased risk of developmental effects, based on studies in laboratory animals.

Italicized numbers indicate the year the data is from i.e (*06* for 2006, *04* for 2004). If no number, data is from 2010.

Table 3: Regulated and non regulated contaminants (Cont.)								
Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Range Detected	Average	Range Detected	Average			
EPA and State Regulated (Cont.)								
Diethyl-hexylphthalate (DEHP)	µg/L			0 - 7.4	1.06	4		Plasticiser; Leaching from PVC and other plastics exposed to water
Fluoride (F)*	mg/L	0.4 - 1.2	0.66	0.9 - 15	4.91	2.0	1	Erosion of natural occurring deposits; water additive that promotes strong teeth;
Haloacetic Acid (HAA5)	µg/L	ND - 7.5	1.88	ND - 7.5	1.11	60		Disinfection byproducts
Dibromoacetic Acid	µg/L	ND	ND	ND - 1.7	0.23			Part of HAA5
Dichloroacetic Acid	µg/L	ND - 2.5	1.03	ND	ND			Part of HAA5
Monobromoacetic Acid	µg/L	ND	ND	ND - 2.7	1.40			Part of HAA5
Monochoroacetic Acid	µg/L	ND - 3	0.75	ND - 4.4	0.37			Part of HAA5
Trichloroacetic Acid	µg/L	ND	ND	ND	ND			Part of HAA5
Iron (Fe)**	µg/L	230 - 830 *06*	493 *06*	ND	ND	300		Secondary Contaminant: Erosion of natural occurring deposits

* Some people who drink water containing fluoride in excess of the Federal MCL of 4 mg/L over many years may get bone disease, including pain and tenderness of the bones. Children who drink water containing fluoride in excess of the State MCL of 2 mg/L may get mottled teeth

** Iron was found at levels that exceed the secondary MCL of 300 µg/L. The Iron MCL was set to protect you against unpleasant aesthetic effects (e.g., color, taste, and odor) and the staining of plumbing fixtures (e.g., tubs and sinks) and clothing while washing.

Italicized numbers indicate the year the data is from i.e (*06* for 2006, *04* for 2004). If no number, data is from 2010.

Table 3: Regulated and non regulated contaminants (Cont.)								
Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Range Detected	Average	Range Detected	Average			
EPA and State Regulated (Cont.)								
Nitrate (NO_3)	mg/L	4.2 - 5.8 *06*	5.1 *06*	3.2 - 23	13.34	45	45	Runoff and leaching from fertilizer use; leaching from septic tanks and sewer systems; erosion of natural deposits
pH	pH units	7.4 - 9.2	7.87	8.0 - 8.3 *09*	8.10 *09*			Secondary Drinking Water Standard: A measure how acidic the water is.
Selenium	µg/L			ND - 9.2 *07*	1.13 *07*	50	50	Erosion of natural occurring deposits
Specific Conductance	µS/cm			840	840	1600		Substances that form ions when in water
Sulfate (SO_4)	mg/L	10 - 26 *06*	18.3 *06*	110	110	500		Secondary Drinking Water Standard: Erosion of natural occurring deposits
Surfactants (MBAS)	µg/L			60 *09*	60 *09*	500		Secondary Drinking Water Standard: Erosion of natural occurring deposits
Total Dissolved Solids (TDS)	mg/L	ND - 160	96.55	560 - 660 *07*	600 *07*	1000		Secondary Drinking Water Standard: Erosion of natural occurring deposits

Italicized numbers indicate the year the data is from i.e (*06* for 2006, *04* for 2004). If no number, data is from 2010.

Table 3: Regulated and non regulated contaminants (Cont.)								
Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Range Detected	Average	Range Detected	Average			
EPA and State Regulated (Cont.)								
Total Trihalomethanes (TTHM)	µg/L	4.1 - 16	9.43	ND - 12	4.36	80		Disinfection byproducts
Bromodi-chloromethane	µg/L	0.85 - 3.8	2.24	ND - 0.61	0.09			Part of TTHM
Bromoform	µg/L	1.4 - 2.1	1.85	ND - 11	3.46			Part of TTHM
Chloroform	µg/L	0.64 - 5.7	2.71	ND	ND			Part of TTHM
Dibromo-chloromethane	µg/L	1.2 - 3.9	2.55	ND - 1.7	0.52			Part of TTHM
Turbidity	NTU	0 - 5.7	0.22	1 - 17 *09*	5.85 *09*	5		Secondary Drinking Water Standard: Cloudiness of water
Vanadium (V)	µg/L			28 - 42 *06*	34 *06*		50	Erosion of natural occurring deposits
Water Quality (Not Regulated)								
Calcium (Ca)	mg/L	1.2 - 8.8	3.95	14 - 33 *09*	22 *09*			Erosion of natural occurring deposits
Magnesium (Mg)	mg/L	ND - 1.6	0.34	2.5 - 6.1 *09*	4.17 *09*			Erosion of natural occurring deposits
Phosphorus, Total (P)	µg/L			ND - 310 *07*	21 *07*			Runoff and leaching from fertilizer use; Erosion of natural occurring deposits

* Turbidity has no health effects. However, high levels of turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Italicized numbers indicate the year the data is from i.e (*06* for 2006, *04* for 2004). If no number, data is from 2010.

Table 3: Regulated and non regulated contaminants (Cont.)								
Analyte	Unit	RO Water System		Domestic System		Maximum Contaminant Level (MCL)	Maximum Contaminant Level Goal (MCLG)	Source of Contamination
		Range Detected	Average	Range Detected	Average			
Water Quality (Not Regulated) (Cont.)								
Potassium (K)	mg/L	3 *06*	3 *06*	1.9 - 19 *07*	7.8 *07*			Erosion of natural occurring deposits
Sodium (Na)	mg/L	35 *06*	35 *06*	160	160			"Sodium" refers to the salt present in the water and is generally naturally occurring.
Strontium (Sr)	µg/L			ND - 670 *07*	290 *07*			Erosion of natural occurring deposits
Total Alkalinity	mg/L	14 - 39	24.71	140 - 160 *09*	136.7 *09*			Erosion of natural occurring deposits
Bicarbonate (HCO_3)	mg/L	17 - 48	30.09	170-190 *09*	176 *09*			Part of Alkalinity
Carbonate (CO_3)	mg/L	ND	ND	ND *09*	ND *09*			Part of Alkalinity
Total Hardness	mg/L	3.7 - 28	12.56	46 - 64 *09*	73 *09*			Erosion of natural occurring deposits: the sum of polyvalent cat-ions present in the water, generally magnesium and calcium. The cat ions are usually naturally-occurring.
Reactive Silica	mg/L			16 - 100 *07*	49.5 *07*			Erosion of natural occurring deposits
Total Silica	mg/L			19 – 98 *07*	49.7 *07*			Erosion of natural occurring deposits, Generally interferes with treatment.

Italicized numbers indicate the year the data is from i.e (*06* for 2006, *04* for 2004). If no number, data is from 2010.